19 November 2003

MEMORANDUM

To: Henry Wong (DTSC)
Andrew Clough, R.G. (OBRA)

From: Michael T. Steiger, P.E. (EKI)

Subject: Pre-design Investigation Memorandum
Former ORP / Building 1 Area
Former Oakland Army Base - EDC Area
Oakland, California
(EKI A10063.00)

On behalf of the Oakland Base Reuse Authority ("OBRA"), Erler & Kalinowski, Inc. ("EKI") prepared this memorandum to describe a focused, pre-design investigation that OBRA is planning to implement at the Former Oil Reclaiming Plant ("ORP") / Building 1 Area ("Site") at the Gateway Development Area in Oakland, California. This planned investigation is not a Remedial Investigation ("RI"); rather it is a focused investigation intended to obtain additional visual descriptions of encountered soil and waste layers, soil physical parameter data, and limited chemical data that will be useful for finalizing design decisions and to provide information to bidding remediation contractors.

This pre-design investigation is currently planned for early to mid December 2003, depending on the availability of drillers and contractors. OBRA will retain the services of an engineering consultant (herein referred to as "CONSULTANT") to implement the field work described in this memorandum. EKI will observe exploratory trenching and soil collection activities conducted by CONSULTANT. The results of the investigation will be included in the draft Remedial Design Implementation Plan ("RDIP") to be prepared by EKI.

The specific objectives of the pre-design investigation are to:

(1) perform Cone Penetrometer Tests ("CPTs") to assess geological stratification, density, and consistency of subsurface soils to aid planning of excavation, and to correlate the CPT data with available chemical data and visual observations obtained during the treatability study and previous investigations by the Army, thereby aiding in the definition of the vertical extent of Building 1 Remediation Waste;

(2) visually assess whether spongy organic residue that is likely to be Building 1 Remediation Waste, or other visually impacted soil, is present adjacent to Buildings 6 and 60 to help OBRA decide whether Buildings 6 and 60 should be demolished prior to remediation of the Site;

(3) collect a limited number of samples of overburden soil for possible use as backfill at the Site for purposes of gathering data on soil physical parameters to aid remedial design; and

(4) collect a limited number of samples of stained and oily soil to augment existing chemical data and evaluate the lateral extent of stained and oily soil that is likely to contain chemicals of concern ("COCs") above remediation goals, and to otherwise aid waste disposal classification for subsequent bidding by OBRA.

SAMPLING LOCATIONS AND ANALYSES

At general investigation locations identified in the field by EKI, CONSULTANT will (1) excavate approximately ten exploratory trenches to a depth of approximately seven feet below ground surface ("bgs"); (2) perform CPTs at the Site for three working days, expected to provide approximately 25 to 30 CPTs to a maximum depth of approximately 15 to 20 feet bgs, and four CPTs to a depth of approximately 45 to 50 feet bgs, depending on encountered field conditions; (3) collect approximately 20 soil samples (assume two per trench) for selected physical parameter analysis, i.e., moisture content and sieve analysis; and (4) collect up to four stained and oily soil samples for chemical laboratory analysis from the sidewalls of four exploratory trenches selected in the field by EKI, depending on encountered field conditions. For each sampling location, CONSULTANT will perform all necessary site underground clearance and notifications, including Underground Services Alert ("USA"), as required by laws and regulations (see Field Procedures below). Proposed exploratory trench and CPT locations are subject to change

depending upon the presence of subsurface or surface obstructions and encountered subsurface conditions.

EKI anticipates that five trenches will be located in asphalt paved areas adjacent to Buildings 6 and 60, one trench will be located in the asphalt paved parking lot south of Bataan Avenue, and four trenches will be located in asphalt and unreinforced concrete areas in the footprint of former Building 1. CONSULTANT will use cones and caution tape to cordon off work zones when excavating exploratory trenches outside of the fenced area. These trenches are expected to be closed each day.

The CPTs will be located in approximately equally spaced locations that cover the known extent of organic residue and stained and oily soil. Three initial CPTs will be located directly adjacent to exploratory trenches excavated previously as part of the treatability test or as part of this investigation to correlate CPT readings with visual observations of the depth of overburden, organic residue, and Bay Mud. If CPT readings cannot be correlated with the visual observations of organic residue thickness, the number of CPTs may be decreased and the number of exploratory trenches increased, as deemed appropriate by EKI in consultation with OBRA.

CONSULTANT will send selected soil samples to a soils laboratory approved by OBRA for analysis of the following physical parameters:

- moisture content by American Society of Testing and Materials ("ASTM") method D2216; each collected sample of gravelly overburden, Bay Mud, sand, or other encountered soil layers (anticipate two samples per exploratory trench, or approximately 20 samples);

- grain size distribution by sieve analysis by ASTM method D422; at least two sieve analyses will be performed on gravelly overburden, and two sieve analyses on sand.

CONSULTANT will send selected stained and oily soil samples to an analytical laboratory approved by OBRA for analysis of the following chemical constituents:

- Title 22 Metals by U.S. EPA Method 6020 and 7000;
- VOCs by U.S. EPA Method 8260B using Encore™ samplers by U.S. EPA Method 5035;

- Selected semi-volatile organic compounds by U.S. EPA Method 8270C[1];
- Total Extractable Petroleum Hydrocarbons ("TPH") quantified as diesel ("TPHd"), and motor oil ("TPHmo") by U.S. EPA Method 8015 Modified with silica gel cleanup; and
- pH by U.S. EPA Method 9045C.

All laboratory analyses will be invoiced to CONSULTANT as part of CONSULTANT's services in accordance with CONSULTANT's Agreement with OBRA.

QUALITY ASSURANCE / QUALITY CONTROL

CONSULTANT will generally follow the preliminary Quality Assurance / Quality Control ("QA/QC") procedures and protocols outlined in the Draft Quality Assurance Program Plan ("Draft QAPP"), currently in circulation at DTSC as an annotated outline for review. These QA/QC activities to be followed by CONSULTANT include implementing standard sample collection and handling procedures as recommended in the Draft QAPP outline, conducting standard laboratory QA/QC analysis, following field documentation procedures as recommended in the Draft QAPP outline, and managing data following the procedures described the Draft QAPP outline. Specifically, CONSULTANT will implement the following QA/QC activities as part of the pre-design investigation.

Sample Location Identification

Sampling locations will be identified and labeled by CONSULTANT as follows:

- Exploratory trenches will be identified by CONSULTANT as B1TP001 through B1TP010; samples collected from each trench for chemical or physical parameter analysis will be identified will the exploratory trench name modified by the sample collection depth interval (e.g., B1TP001-1-2).

- CPT borings will be identified by CONSULTANT as B1CPT001 through B1CPT030; no samples for chemical analysis will be collected from CPT locations.

[1] Include the following PAHs in the chemical analysis: acenaphthene, acenaphthylene, anthracene, benzidine, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(b,k)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, hexachlorobutadiene, indeno(1,2,3-c,d)pyrene, naphthalene, phenanthrene, pyrene.

Sample Handling and Documentation Procedures

CONSULTANT will prepare sample tracking documents so that the sample handling and tracking can be controlled. CONSULTANT will fill out forms and labels in the field with waterproof ink. Sample tracking documents will include daily field logs, borehole logs, sample labels, and chain-of-custody records. CONSULTANT will prepare these records as part of sampling activities.

CONSULTANT's daily field logs will contain information regarding each exploratory trench and CPT boring. Such information will include sample collection time and date, sample identification numbers and depths, photoionization detector or flame ionization detector readings, company and names of individuals operating the equipment, and description of sampling methods and any necessary modifications.

CONSULTANT will attach sample labels to each sample container collected for chemical or physical parameter analysis. The label will include the unique sample identification number (described above), the sample depth, the time, and the date when the sample was collected.

CONSULTANT will initiate chain-of-custody records for each sample at the time of sample collection. Chain-of-custody records will remain with the sample through testing at the laboratory and include the following information:

- Client and project number
- Site name
- Name of sample collector
- Sample identification for each sample
- Laboratory sample number for each sample
- Date and time sample collected for each sample
- Preservative used (if any) for each sample
- Sample matrix for each sample
- Type of sample container used for each sample
- Any filtering performed or requested for liquid samples, if applicable
- Analysis requested for each sample
- Name and destination laboratory
- Signatures of all persons involved in possession of the samples; that is, "relinquished by" and "received by"
- Dates and times of transfers of sample possession

- Any remarks by either sample collector or laboratory.

When transferring samples to the laboratories, the individuals relinquishing and the individuals receiving the samples will sign, date, and note the time on the chain-of-custody record. A separate chain-of-custody record will accompany each transfer of samples. CONSULTANT will enter the method of shipment and courier name on the chain-of-custody records.

Data Management

Physical parameter data and visual observations will not be entered into the electronic database maintained by OBRA. Upon DTSC's review and approval of the analytical results of the pre-design investigation, EKI will enter chemical data into the master electronic database in accordance with the preliminary electronic data management procedures as provided in the Draft QAPP outline.

Laboratory Documentation

For chemical data, laboratory documentation requirements will be limited to Level II reporting (i.e., full data packages, undiluted and diluted results, and associated higher level reporting will not be requested from the laboratories). However, the laboratory will be required to submit matrix spike ("MS") and matrix spike duplicate ("MSD") results and, if needed, to provide copies of chromatograms for EPA Method 8015M analysis of petroleum hydrocarbons.

Laboratory QA/QC Analyses

For chemical data, laboratory QA/QC measures will include MS/MSD samples, laboratory control samples ("LCS"), laboratory duplicates, method blanks, and surrogate analyses. With the exception of surrogate analyses, all the above QA/QC measures are "batch" related, i.e., the QA/QC samples are included as single samples within each batch of 10 routine samples. Laboratory reports will contain laboratory-provided QA/QC results associated with the analyses.

FIELD PROCEDURES

This section presents an overview of field procedures to be used by CONSULTANT during implementation of the pre-design investigation.

Preparation for Field Work

Prior to initiating field work, CONSULTANT will perform the following preliminary tasks:

- Obtain permits, as needed (e.g. from the Alameda County Public Works Agency and County Health Department);
- Coordinate site access as need with OBRA;
- Coordinate with EKI and mark proposed exploratory trench and CPT locations in the field, in the general locations indicated by EKI;
- Notify Underground Services Alert ("USA") of planned subsurface work at least 48 hours prior to initiating subsurface work;
- Retain the services of a private underground utility locating company to determine if there are buried utilities in the proposed exploratory trench and CPT locations;
- Subcontract with a 1910.120 compliant remediation contractor licensed in the State of California to perform all planned exploratory trenching activities;
- Subcontract with a licensed driller to perform CPTs;
- Subcontract with certified analytical laboratories approved by OBRA to conduct chemical and physical parameter analyses;
- Subcontract with a licensed land surveyor to survey the exploratory trench and CPT boring locations; and
- Prepare a site-specific Health and Safety Plan for its operations at the Site.

Trenching and Visual Observation

CONSULTANT will excavate approximately ten exploratory trenches under EKI observations at general locations indicated by EKI in the field. Subsequent Site Drawings will provide surveyed locations. Each trench is anticipated to be approximately seven feet deep, two feet wide, and seven feet long. Trenches will be excavated using a soft-tired backhoe to reduce potential damage to the existing covering material at the Site. To the extent practicable, overburden and unimpacted soil underlying the tarry residue or stained and oily soil will be excavated separately and temporarily placed in separate stockpiles adjacent to each exploratory trench for visual inspection.

CONSULTANT will log soil lithology in the field during trenching. The CONSULTANT's geologist or engineer logging the soil will be a California registered geologist or professional civil engineer. Particular attention will be used to note layering,

depth, thickness, and distribution of organic residue and other impacted soil. During trenching, CONSULTANT will use an organic vapor meter ("OVM") to screen for organic vapors, and a gas detector to screen for hydrogen sulfide gas and sulfur dioxide gas. CONSULTANT will include these field measurements on the exploratory trench logs.

Collecting Samples for Chemical Analysis

If stained and oily soil is encountered in an exploratory trench, CONSULTANT will collect one discrete sample of such impacted soil from the sidewalls of the trench when requested by EKI. CONSULTANT will collect all other required samples from the backhoe bucket using a disposable plastic scoop and transfer the samples to pre-cleaned, laboratory-supplied containers appropriate for the specified method of chemical analysis. Soil samples identified for VOC analysis will be immediately subsampled by CONSULTANT from the containers or from soil remaining in the backhoe bucket using EnCore™ samplers by U.S. EPA Method 5035, in accordance with ASTM recommended procedures.

Collecting Samples for Physical Parameter Analysis

CONSULTANT will collect at least two disturbed soil samples from the sidewalls of each exploratory trench, consisting of a sample collected at approximately 6-inches below the bottom of the asphalt, concrete, or landscape material, three feet bgs, and six feet bgs. If encountered in an exploratory trench, CONSULTANT will collect from each trench at least 1 sample of the gravelly overburden, 1 sample of Bay Mud, and 1 sample of sand found below the gravelly overburden. CONSULTANT may adjust the sample depths in order to collect 1 sample of each type of encountered material. CONSULTANT will collect the disturbed soil samples directly from the backhoe bucket, and place the samples into sealable moisture tight containers appropriate for moisture content measurements. CONSULTANT will collect at least two samples of gravelly overburden soil from two separate exploratory trenches with sufficient volume to conduct a sieve analysis. If encountered in an exploratory trench, CONSULTANT will collect a sufficient volume of sand found below the overburden for sieve analysis.

Cone Penetrometer Tests

CONSULTANT will perform CPTs for a period of three working days, which is expected to provide approximately 25 to 30 CPTs to a depth of approximately 15 to 20 feet bgs and four CPTs to a depth of approximately 45 to 50 feet bgs, or practical refusal, by hydraulically pushing a 1.4- to 1.7-inch-diameter, cone-tipped probe into the ground from

the center of a 20-ton truck. Electrical strain gauges within the cone will continuously measure soil parameters during the entire depth of each probe. Soil data will be recorded in the field by a computer. Accumulated data will then be processed by a computer to provide engineering information, such as tip resistance and friction ratio by depth, as well as interpreted Standard Penetration Test N-values, undrained shear strength, internal friction angle, and soil classification. Upon completion, CONSULTANT will backfill CPT holes with cement-bentonite grout.

Three initial CPTs will be located directly adjacent to exploratory trenches excavated previously as part of the treatability test or as part of this investigation to correlate CPT readings with visual observations of the depth of overburden, organic residue, and Bay Mud. If CPT readings cannot be correlated with the visual observations of organic residue thickness, the number of CPTs may be decreased and the number of exploratory trenches increased, as deemed appropriate by EKI in consultation with OBRA.

Decontamination of Sampling Equipment

CONSULTANT will decontaminate the backhoe bucket before moving from one trench to the next using shovels or brooms to dislodge accumulated dirt. If organic residue, stained and oily soil, or other soil appears to be adhering to the bucket, or if the bucket appeared to be oily, CONSULTANT will clean bucket further with brushes and a solution of Alconox® detergent.

CONSULTANT will decontaminate shovels, trowels, spatulas, spoons, and other reusable sampling equipment before each use to minimize the opportunity for cross-contamination of samples. Decontamination of the sampling equipment will be accomplished in a designated area by either steam cleaning, or washing in a solution of Alconox® or equivalent non-phosphate detergent, followed by rinsing with clean water, then rinsing with distilled water. Disposable sampling equipment will be discarded after each use. CONSULTANT will collect and dispose of wastewater from decontamination activities.

Restoration of Sampling Locations

After sampling and logging are completed at each exploratory trench location, CONSULTANT will replace excavated materials into the trenches. Any separately stockpiled and visually unimpacted soil from layers underlying stained and oily soil and otherwise unimpacted soil will placed into the bottom of the trench. Excess stained and oily soil or otherwise impacted soil will then be placed on top of the unimpacted soil, then covered with at least 3 feet of stockpiled overburden soil. CONSULTANT will

lightly compacted the backfilled trenches by wheel rolling using the backhoe. If the trench is located in an area where the existing surface is paved, surface material will be restored with at least six inches of hot asphalt patch. In areas where vehicular traffic is anticipated, CONSULTANT will compact the overburden in eight-inch lifts using a hand compactor or tamper to 95% of maximum dry density, as determined by ASTM D1557. Excess overburden soil from trenching, if any, will be stockpiled on-site and managed by OBRA in accordance with Section 7.4.2 of the Risk Management Plan for the former Oakland Army Base ("RMP"). Sampling and other costs associated with management of stockpiled soil will be the responsibility of OBRA.

CONSULTANT will backfill CPT holes with cement-bentonite grout in accordance with permit requirements.

Management of Investigation-Derived Waste

CONSULTANT will place all soil cuttings and other investigation derived waste in DOT-approved 55-gallon drums or five-gallon buckets. CONSULTANT will segregate used personal protective equipment, rinsate, and other decontamination liquids by placing these wastes according to type in labeled separate 55-gallon drums or five-gallon buckets. CONSULTANT will transport drums and buckets to an on-site temporary storage location designated by OBRA representatives. CONSULTANT will assist OBRA with waste classification and coordination so that wastes can be disposed by OBRA at appropriately permitted off-site facilities. Wastes will be managed for disposal by OBRA in accordance with applicable laws and regulations. Signing of manifests and costs of transportation and off-site disposal of the investigation-derived waste will be the responsibility of OBRA.

Surveying Borehole Locations

The horizontal and vertical coordinates of the corners of each trench and the center of each CPT boring location will be surveyed by a licensed land surveyor, subcontracted by CONSULTANT. The survey will be conducted once field work is completed using either GPS or traditional survey methods. The horizontal coordinates will be +/- 0.25 feet in the Zone 3 California State Plane Coordinate System, NAD 1983. The vertical coordinates will be +/- 0.1 feet in NAVD88 established from NGS Benchmark D-1203. EKI will add the surveyed coordinates w to the analytical database for the former OARB.

SITE-SPECIFIC HEALTH AND SAFETY PLAN

COCs have been measured in the spongy organic residue and other impacted soil at levels that may constitute chemical hazards to persons working at the site or handling the samples. In addition, some samples of the spongy organic residue have exhibited an extremely low pH, and may generate SO_2 or H_2S gas. CONSULTANT and EKI will each prepare their own stand-alone health and safety plans ("HSPs") for the work that addresses health and safety concerns specific to the Site and the investigation activities proposed herein.

HSPs for field sampling activities will be prepared by CONSULTANT and EKI under the direction of a Certified Industrial Hygienist ("CIH") in accordance with Section 7.1 of the RMP. The HSP will be prepared by CONSULTANT and EKI in accordance with California Occupational Safety and Health Agency ("Cal/OSHA") occupational health and safety standards and currently available toxicological information for COCs at the work site. The RMP provides descriptions of requirements for the HSP, and it is the responsibility of each entity to refer to the RMP and appropriate health and safety laws and regulations during preparation of its HSP.

REPORTS

A cover letter will be prepared by CONSULTANT to transmit the results of the pre-design investigation to OBRA and EKI. The cover letter will include a brief description of field methods and analyses. CONSULTANT will attach summary data tables, trench logs, CPT logs, field notes, and copies of laboratory analytical reports for chemical and physical parameter analyses to the cover letter. The results of the pre-design investigation will be summarized by EKI in the draft RDIP.

SCHEDULE

Field sampling activities are anticipated to begin in early to mid December 2003. EKI will forward the results of the pre-design investigation to DTSC approximately 3 weeks after completion of field activities, and an analysis of the results will be included in the RDIP prepared by EKI to be submitted to DTSC by the end of December 2003 or early January 2004. These dates are approximate and contingent upon availability of contractors, normal laboratory turn-around times, and no project delays due to adverse weather, encountered field conditions or other conditions.

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